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PENSOFT

First record of Brazilian Porcupine, *Coendou prehensilis* (Linnaeus, 1758) (Rodentia, Erethizontidae), from the Humid Chaco of Paraguay

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Abstract

A Brazilian Porcupine, *Coendou prehensilis* (Linnaeus, 1758), was encountered and photographed at night on a recently cleared forest path in Presidente Hayes Department, Paraguay. Although *C. prehensilis* is widespread and has been reported from a variety of ecoregions and habitats, this record in western Paraguay is the first from the South American Humid Chaco ecoregion.

Keywords

Distribution, photographic record, porcupine

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Introduction

Several mammalian species are known in Paraguay from very few specimens. In particular, caviomorph rodents tend to be poorly represented, both in Paraguay (Owen et al. 2018) and regionally (Pardiñas et al. 2021a). Most caviomorph rodents are often overlooked because they are neither small enough to enter common rodent traps nor large enough to be "charismatic" species, and members of Erethizontidae exemplify this paucity of information (D'Elía et al. 2008). Thus, detailed current information on the distribution and ecology of South American caviomorph rodents is generally scarce, and porcupines in particular (Owen et al. 2018; Ramírez-Chaves 2020; Pardiñas et al. 2021a).

Located in south-central South America, Paraguay encompasses the interface of several of the major South American ecoregions: Atlantic Forest, Cerrado, Pantanal, and Wet and Dry Chaco (Olson et al. 2001). Notwithstanding its ecoregional diversity, the mammalian fauna is often described as poorly known (Yahnke et al. 1998; Myers et al. 2002; D'Elía et al. 2008; de la Sancha et al. 2017). However, biological investigations during the last 15–20 years have revealed several previously unrecorded mammalian species from the country, including four species of bats (Stevens et al. 2010; Owen et al. 2014; Moratelli et al. 2015), an armadillo (Smith et al. 2011), a carnivore (Smith et al. 2013), five marsupials (de la Sancha et al. 2017; Voss and Jansa 2009; de la Sancha and D'Elía 2015; de la Sancha et al. 2017) and several rodents (D'Elía et al. 2008, de la Sancha et al. 2009, Owen et al. 2018, de la Sancha et al. 2020).

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Of over 30,700 mammal specimens known from Paraguay (Owen and Camp 2021), we are aware of only 12 porcupine specimens, representing just two species: Brazilian Porcupine, *Coendou prehensilis* (Linnaeus, 1758) and Paraguayan Dwarf Hairy porcupine, *Coendou spinosus* (Cuvier, 1823). Of these, there are only three vouchers of *C. prehensilis*. Here, we report a fourth locality for *C. prehensilis*, the first record of an erethizontid from west of the Paraguay River and the first from the Humid Chaco ecoregion. Moreover, this is the first verified record of this species in Paraguay since 1981.

Methods

Paraguay is a landlocked country in south-central South America and has an area of over 400,000 km^2 (Fig. 1). It straddles the Tropic of Capricorn, with roughly half of its area on either side, and is in the transition between tropical and subtropical South America. Virtually all precipitation is in the form of rain, with small amounts occasionally contributed by hail, and very minimal amounts by frost or the exceedingly rare light snowfall. Rains are generally heaviest from October to February, variable from March to May, and least from June to September during the dry season (Bertoni and Gorham 1973; Gorham 1973).

While walking on a recently cleared forest path at night, at approximately 21:00, Alvin Sawatzky encountered an adult porcupine walking on the ground. The specimen appeared healthy, and it did not exhibit defensive behavior or otherwise respond to the observer, but slowly walked into the forest after the encounter. The individual was photographed, and geographic coordinates were recorded using a GPS receiver. The information was sent to the Facultad de Ciencias Exactas y Naturales of the Universidad Nacional de Asunción (Paraguay) for species identification. The animal was not collected, as the observer was not a biologist, was

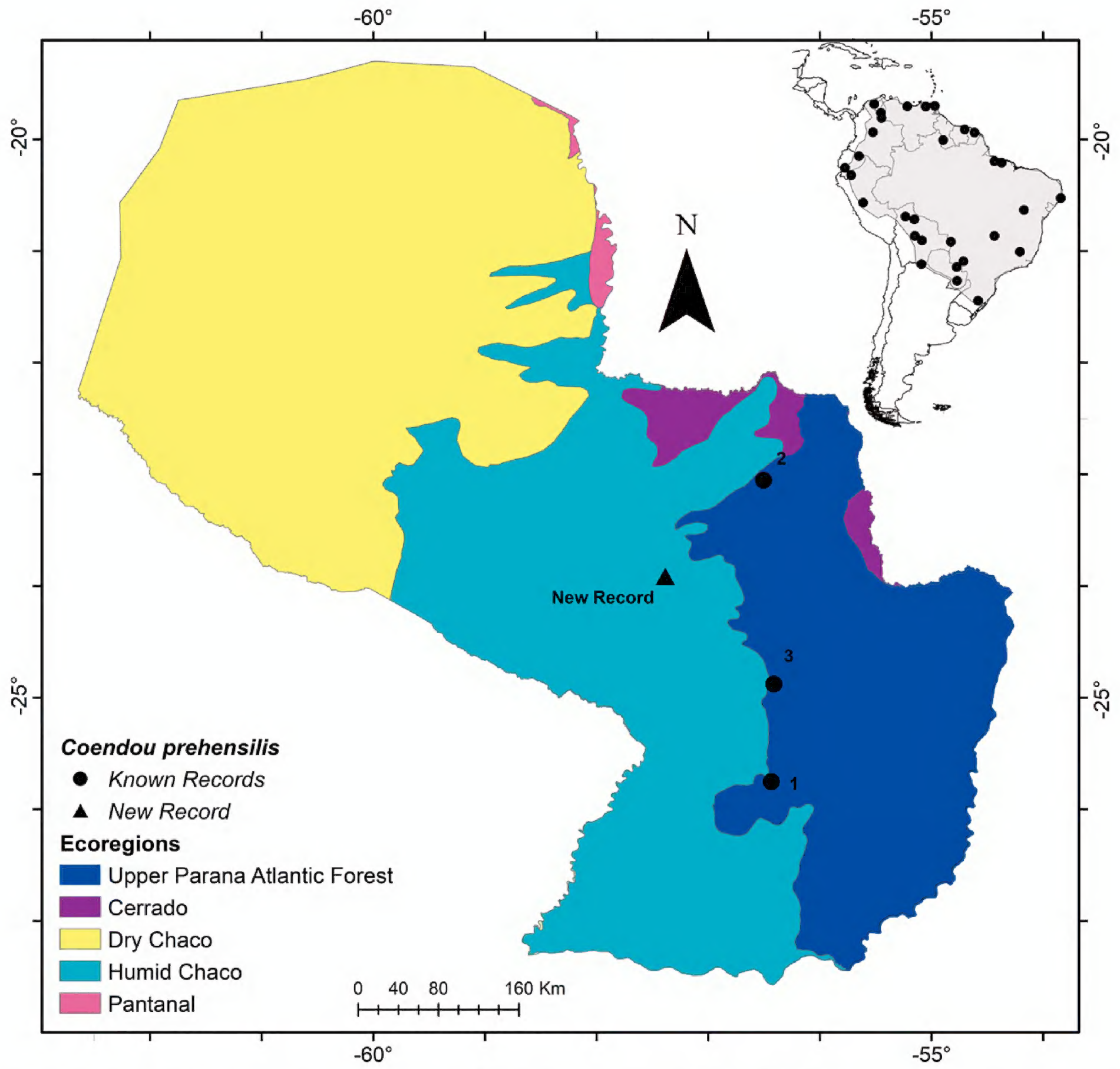

Figure 1. Paraguay ecoregions and records of *Coendou prehensilis* in the country. See Table 1 for information on three previously known records. Inset map (adapted from Voss 2015) shows selected marginal locality records of *C. prehensilis* in South America.

Table 1. Three previous confirmed voucher-based records of *Coendou prehensilis* in Paraguay. All are from the western margin of the historic distribution of the Upper Paraná Atlantic Forest. See Figure 1 to visualize localities. Abbreviations: BMNH = British Museum of Natural History, UMMZ = University of Michigan Museum of Zoology, MNHNP = Museo Nacional de Historia Natural del Paraguay.

Museum	Catalog number	Department	Locality	Year	Map locator number
BMNH	1923.11.27.3	Guairá	Villarrica	1922?	1
UMMZ	146507	Concepción	12 km by road S Yby-Yau	1979	2
MNHNP	766	San Pedro	50 km N Coronel Oviedo	1981	3

unaware of the importance of collecting a specimen, and had no means available to subdue or capture a porcupine. To identify the species, we follow Voss (2011, 2015) and Leite el al. (2011). We consulted D'Elía et al. (2008), Voss (2015), Vertnet (portal.vertnet.org/search) and GBIF (https://gbif.org.org) for specimen records and distribution of *Coendou prehensilis* in Paraguay.

Results

Order Rodentia
Family Erethizontidae

***Coendou prehensilis* (Linnaeus, 1758)**
Figure 2

New record (Fig. 3). PARAGUAY • Presidente Hayes Department; estancia Coeyu, a cattle ranch; 23°55′ 13.74″S, 057°23′47.98″W; 13.VIII.2020; 1 adult specimen (photographed; Fig. 2).

The record was made in deciduous thorny forest habit of the Humid Chaco ecoregion (Fig. 3).

Identification. From the photograph, it is clear that the animal belongs to the genus *Coendou* based on its general form (stocky body, short legs, long claws, and small eyes and ears) and pelage consisting of quills covering the entire body, much of the face and limbs, and a portion of the tail (Voss 2015). Two species of *Coendou* are known from Paraguay, *C. spinosus* and *C. prehensilis*. These two species are easily distinguished, as the pelage of *C. prehensilis* consists of long, tricolored quills with white tips interspersed with shorter bicolored quills over most of the dorsum including the rump, with the dorsal quills gradually (not abruptly) decreasing in length from upper back to rump (Voss 2015). In contrast, the pelage of *C. spinosus* has long dorsal fur nearly covering the quills, and many of the quills are orange- or yellowish-tipped, especially on the flanks.

Figure 2. *Coendou prehensilis* photographed in the Humid Chaco ecoregion, Presidente Hayes Department, Paraguay.

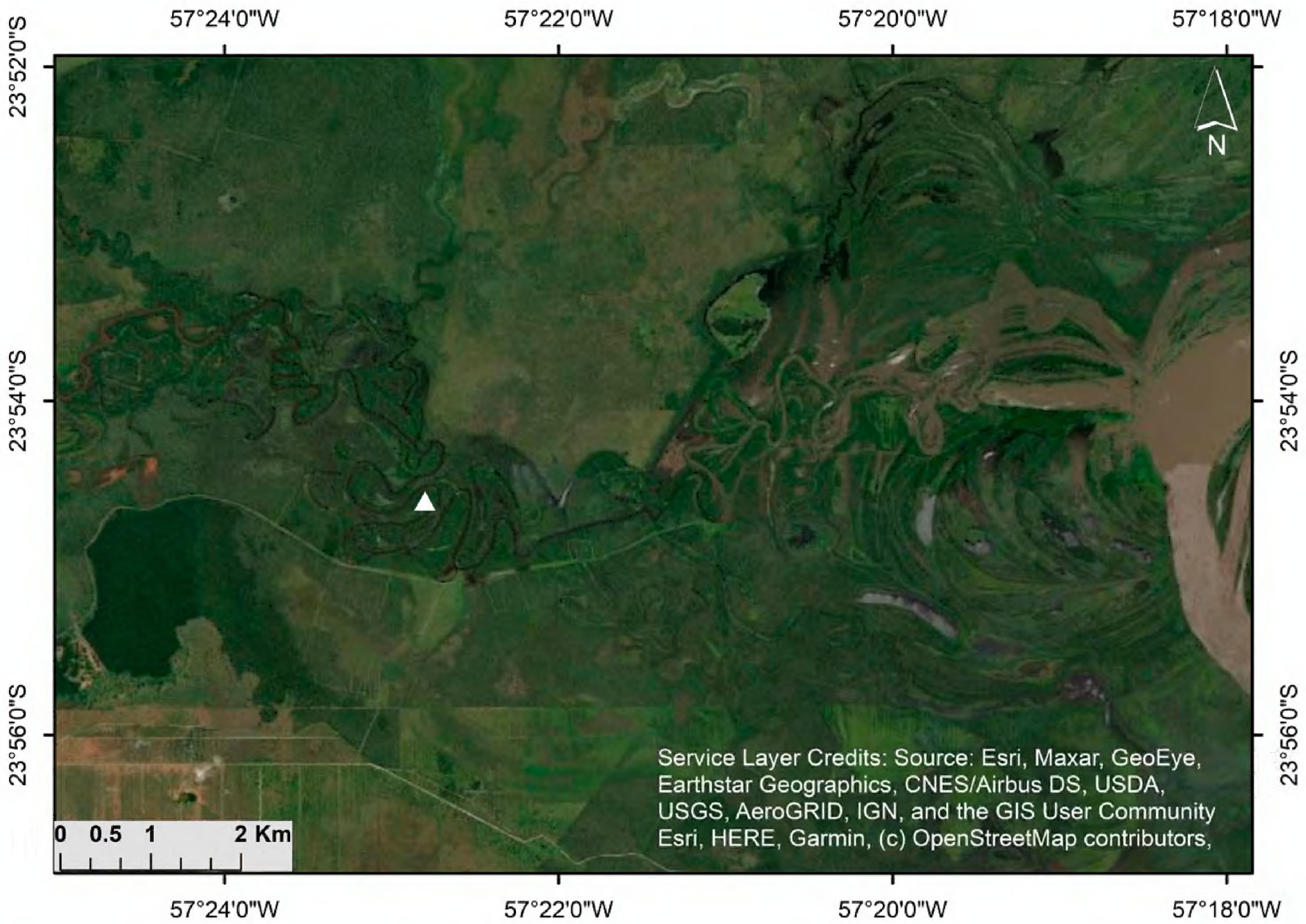

Figure 3. Satellite view of the habitat where *Coendou prehensilis* was recorded. The new locality is marked with a triangle in the left center of the image, within an area of riparian vegetation associated with a meandering stream (riacho) which flows roughly from west to east, toward its confluence with the Paraguay River, which is seen at the extreme right of the image.

Two other species of *Coendou* may potentially (although doubtfully) be encountered in the Paraguayan Chaco (Voss 2015). An isolated population of *Coendou rufescens* (Gray, 1865) is found in Cochabamba, Bolivia. However, in *C. rufescens* the tail is usually <50% of head and body length and hard, sharp, barbed defensive quills are found only on the rump (Voss 2015). An isolated population of *Coendou bicolor* (Tschudi, 1844) has been reported from Jujuy Province, Argentina. This species is distinguished from *C. prehensilis* by uniformly bicolored quills, which are abruptly shorter on the lower back and rump than on the shoulders and upper back (Voss 2015). Thus, Figure 1 unambiguously shows *C. prehensilis*.

Discussion

This new record of *Coendou prehensilis* is the fourth confirmed locality for the species from Paraguay and increases our scant knowledge of erethizontid distribution, biogeography, and habitat associations in the Southern Cone of South America. Moreover, this is the first verified record from Paraguay in nearly four decades.

The locality of this record is also noteworthy as it is the first from the Humid Chaco ecoregion and from west of the Paraguay River. This river is considered a biogeographic barrier for non-volant animals (Myers 1982; de la Sancha et al. 2017), although some other rodent species have recently been found to occur on both sides of this river (D'Elía et al. 2008; Pardiñas et al. 2021b).

Coendou prehensilis is a forest-dwelling and generally arboreal species (Roberts et al. 1985; Voss 2015). Although the Humid Chaco is primarily a palm savanna habitat, seasonal watercourses (called riachos) flow eastward from the central or western Chaco toward the Paraguay River, and riparian woodlands are often associated with these watercourses, which may serve as corridors for forest-dwelling species to move westward into the more arid central Chaco. Indeed, our new locality is within such a riparian woodland along the Riacho Montelindo (Fig. 3).

Finally, this new record underscores the paucity of detailed and current information on the distribution and ecology of South American porcupines and of caviomorph rodents in general, which are often underrepresented in biological inventories (Owen et al. 2018; Ramírez-Chaves et al. 2020; Pardiñas et al. 2021a). We urge biologists and environmental managers to focus more attention on these understudied but ecologically important medium-sized mammalian herbivores.

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Authors' Contributions

Conceptualization: AW. Writing – original draft: AW, RO. Writing – review and editing: AW, RO. Data curation: RO. Visualization: AW.

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